

# Beamforming with Uncertain Weights

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- [beamform\\_reg.pdf](#)
- [beamform\\_reg.m](#) (you need [CVX](#) to run this script)

In this letter, we show that worst-case robust beamforming, with uncertain weights subject to multiplicative variations, can be cast as a convex optimization problem. We interpret this robust beamforming as a weighted complex  $l_1$ -regularization, and show that it can be solved with the same computational complexity as nominal beamforming, ignoring the variations. We derive a simple lower bound on how much worse the robust beamformer will be compared to the nominal beamformer solution with no weight uncertainty. We demonstrate the robust approach with a simple narrowband beamformer.